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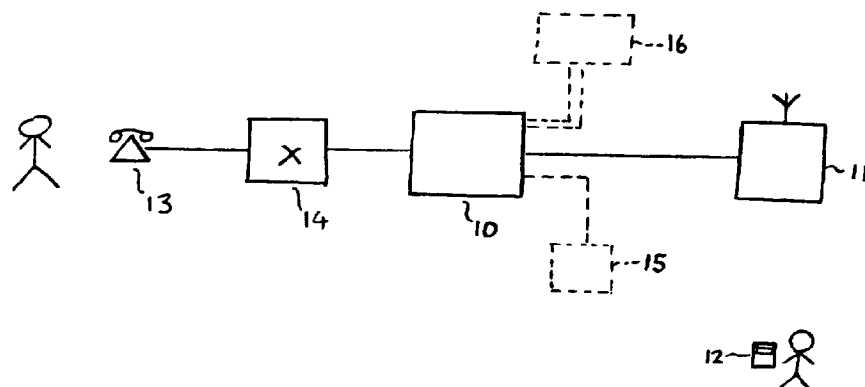
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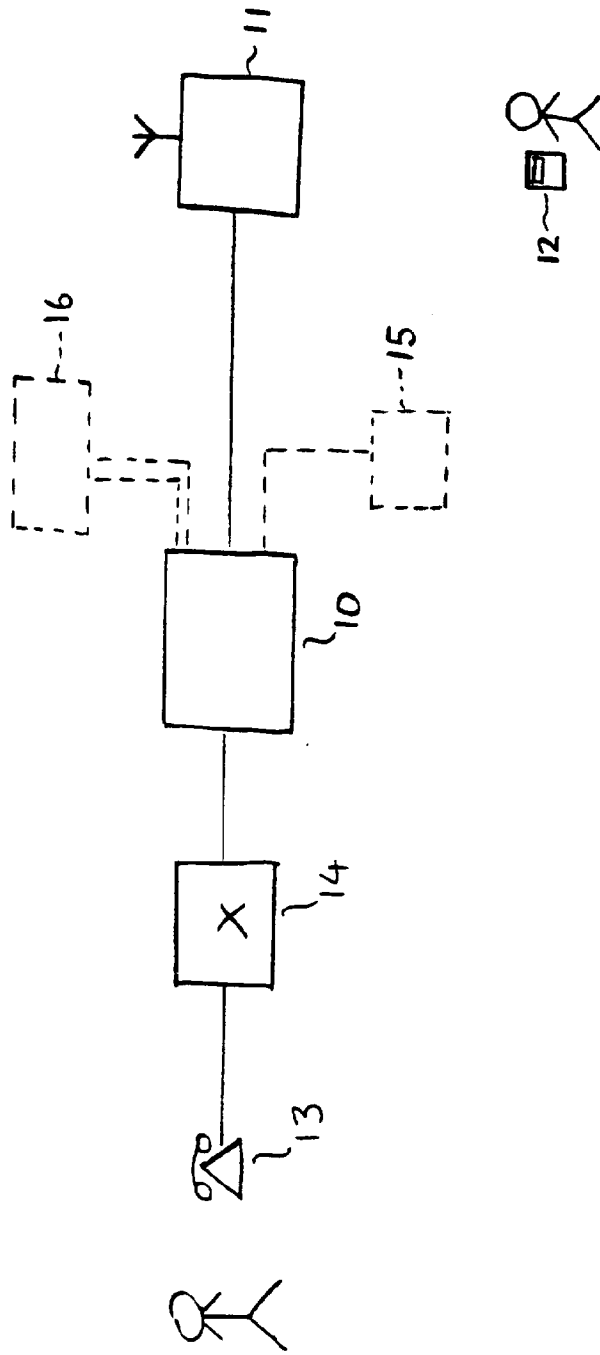
**INT CL<sup>6</sup> H04Q**

## (54) Communication systems

(57) In a communication system allowing alphanumeric messages to be entered on the keypad of a telephone 13, for onward transmission by a transmitter 11 to a selected receiver 12 for display on the receiver, a telephony server 10 provides confirmation of correct message entry by speaking back the complete message or parts of the message to the caller entering the message. The alphanumeric message can be entered on the keypad by the use of a numeric code system in which numbers correspond to letters, words and/or phrases, and the telephony server 10 decodes and composes the message prior to speaking back the message for confirmation.



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COMMUNICATION SYSTEMS

This invention relates to communication systems which can be used to send alphanumeric messages from a telephone terminal to a desired destination.

Known communication systems include selective call or paging systems which generally use automatic means for sending tone or numeric messages to a receiver and manual means to send alphanumeric messages to an alphanumeric receiver. However, some systems exist which allow letter input from an ordinary MF (multi-frequency) telephone using a predefined alphanumeric code.

As speech recognition capability improves, there exists the possibility of automatic input of pager messages, but given the large potential vocabulary and large variation found between native speakers this approach is not yet considered fully practicable.

In one known paging system, automated services exist for numeric and alphanumeric pagers that work as follows. If a subscriber wishes a numeric pager user to telephone them, they dial a telephone number consisting of a predefined prefix followed by the number of the required pager. Upon answer they then press the star key twice. As the system captures the caller's calling line identity, their telephone number is then transmitted to the numeric pager. This is a very fast and effective means of transmitting the caller's telephone number, but does not allow specific numeric or alphanumeric messages to be sent. For subscribers with alphanumeric pagers, it is possible to enter a message using two keystrokes for each letter; however, this system suffers from a number of disadvantages as the caller receives no feedback on the message input. This lack of feedback and flexibility therefore make the service difficult for widespread use.

In the United Kingdom, British Telecom operates a paging bureau which allows alphanumeric messages to be sent to any alphanumeric pager. This service provides for the caller to speak the required message to a bureau operator, who then enters the message via a keyboard for transmission to the requested pager. The need to route all alphanumeric messages through a bureau operator leads to relatively high operating costs which are then reflected in the pager user's service charges.

Traditionally, pagers have been available on a subscription basis with calls to the service priced relatively cheaply. However, a number of new service offerings are now available and one of these, known as "Caller Party Pays" paging, allows a pager user to buy a pager with  
5 one-off payment, with the service revenue being gained from the calling party initiating message transmission, calls being made to premium rate numbers from which the paging operator receives a share of the call revenue. This approach has allowed numeric pagers to be available on a non-subscription basis and generally numeric messages can be input  
10 from any telephone using either MF signalling or speech recognition of the digits, i.e. speech recognition using a limited vocabulary in order to achieve good recognition performance.

Current systems do not provide a mechanism for widespread use of Caller Party Pays paging for alphanumeric pagers since the provision of  
15 bureau operators in such a system would result in the costs of the calls being too high for widespread use.

According to the invention there is provided a communication system comprising means for decoding alphanumeric messages entered by the use of telephone dialling means, and means for transmitting the  
20 alphanumeric messages to selected receivers having message displays, wherein the message decoding means comprises a telephony server operable to read back messages entered by the telephone dialling means for confirmation of correct entry.

According to the invention there is also provided an automatic  
25 telephony system consisting of a telephony server connected to the telephone network and also connected to a paging transmission system, wherein a caller wishing to send an alphanumeric paging message automatically to a pager can access the telephony server over the telephone network and in response to instructions and prompts, if these  
30 are required, can input codes for either complete messages, complete words including their cognate forms, or individual letters in order to send complete alphanumeric messages to a pager.

The telephony server provides a means of interacting in an effective manner with the caller and, in the preferred embodiment, the  
35 caller may select letters, words or phrases using MF signalling from the telephone keypad, with confirmation of input provided at the letter, word or phrase level as appropriate, in order to allow

effective widespread use of automated alphanumeric paging. The telephony server then transmits complete messages to the paging transmission system for onward transmission to the selected pager.

As an alternative to use of the telephone keypad, the numeric  
5 codes can be spoken by the caller if the system has limited speech recognition ability including recognition of numbers and a few words such as "star" and "hash", and also possibly others such as "enter" and "help".

The present invention also provides an automated paging system  
10 comprising a telephony server connected to a public or private telephone network with means for interacting with a caller and providing spoken feedback using an efficient entry code system for words and/or letters and phrases.

The present invention further provides a telephony server with  
15 stored or created spoken words with storage of cognate forms that can be easily accessed and used to define customised messages.

From another aspect, the present invention provides a record of all messages within a time period with means via the telephony server of accessing such messages.

From a further aspect, the present invention provides an  
20 automated paging system as described above with means for predefining messages in advance in order to provide notification of events such as meetings, birthdays, anniversaries or the like.

From a still further aspect, the present invention provides an  
25 automated paging system as described above with a connection between the telephony server and a speech recognition means which may consist of automated equipment, human operators or a mixture in order to cost effectively allow limited vocabulary input.

The invention will now be described by way of an example with  
30 reference to the accompanying single figure drawing which shows an automated paging system according to an embodiment of the invention, with optional features shown connected by broken lines.

Referring to the drawing, the preferred automated paging system comprises a telephony server 10 connected to a paging transmission  
35 system 11 which can transmit to a multiplicity of pagers including a specific pager 12. The telephony server 10 is accessed from a telephone 13 via a telephone network 14.

The telephony server 10 may, for example, be a Telsis Hi-Call, particular features of which are described in International Patent Application Publication No. WO 92/22165. In that publication, the telephony server is referred to as a voice services equipment (VSE).  
5 Other terms include voice response system (VRS) or interactive voice response (IVR) equipment.

The operation of the telephony server 10 will now be described in the context of automating alphanumeric message entry and transmission to pagers.

10 A caller wishing to send an alphanumeric message to the pager 12 would dial from the telephone 13 a telephone number that can be one or more predefined numbers or a telephone number related in some way to the pager number.

In the event that the pager number does not form some part or  
15 part thereof of the telephone number dialled, then either a predefined pager will be selected based on some other information, which may be the caller's telephone number or other data, or at some time during the interaction between the caller and the telephony server the pager number will be entered.

20 The telephony server 10 will answer the call routed via the telephone network 14 and interact with the caller in order to accept in a manner acceptable for widespread use the input of alphanumeric messages for onward transmission via the paging transmission system 11 to the pager 12.

25 The telephony server 10 preferably includes a stored list of words (including personal names) for reading back to the caller, and also means for correlating numerical codes input by the caller with letters, words, and/or phrases, by means of which the equipment is able to decode messages entered by the use of a telephone dialling means,  
30 such as a telephone keypad, and to read back the entered messages for confirmation of correct entry.

In order for effective alphanumeric input to occur it is made possible for the caller to form a message at the phrase, word or letter level. The telephony server 10 has the ability to interact with the  
35 caller and the ability from pre-stored or generated data to speak back the phrase, word or letter entered, in the case of letter entry to speak back the word input, and in the case of phrase or word input to

speak back the phrase entered. If a word is input by means of letter entry and that word is in the spoken dictionary, then it will be spoken back as a word; otherwise it will be spelt using the input letters. In all cases, the complete message is read back to the caller before  
 5 transmission is confirmed.

The telephony server 10 in a particular embodiment contains spoken forms of all letters and predefined words and phrases in neutral and stressed form in order that effective feedback can be provided, as human communication relies on interactivity for its effectiveness. In  
 10 the particular embodiment, approximately 1,000 codes are used to define letters, words and phrases for use by a caller.

The general format of use provides for entry of a word, letter or phrase, using a numeric code followed by star.

A particular feature of this technique is that the system allows  
 15 simple input of the cognate form of words by stepping through the available set.

As an example,

519\* would be used to transmit the word "man" and

519\*\* would be used to transmit the word "men".

20 As a further example,

870\* would be used to transmit the word "listen"

870\*\* would be used to transmit the word "listened"

870\*\*\* would be used to transmit the word "listens"

870\*\*\*\* would be used to transmit the word "listening".

25 The telephony server 10 stores or generates all available cognate forms and this provides an effective means of simply customising messages.

Although the system provides for alphanumeric message input from a standard telephone handset with MF signalling, a number of handsets  
 30 now exist with 26 letter keys and the system can be adapted to work directly with letter key codes, whether audio or data, from such telephones with appropriate audio feedback.

In addition to the letters, words and phrases stored in the telephony server 10, the system may also provide for a large number of  
 35 first names to be stored so that these can be accessed and used as required.

In the normal mode of operation a message is sent as a sequence

of words and every time the star key is depressed the word or its cognate form, if available, is spoken to the caller. When message entry is complete, the complete message is read back to the caller for final confirmation before transmission to the pager 12 via the paging  
5 transmission system 11, and in the event that the word is not present as a unit or cannot be created at the word level, it would be spelt out.

It is envisaged that the telephony server 10 may include, instead of or in addition to the stored list of words constituting the spoken  
10 dictionary, means for generating words from pre-stored rules. In that case, only words not capable of being generated automatically will need to be spelt out.

It will be apparent that the ability to input letters, words, phrases, numbers and names by means of codes is made more powerful by  
15 the use of cognate forms which can be accessed with simple keypresses. In a further variation of this technique, it is possible to utilise the cognate forms more flexibly; for example, if 519\* is "man", 519\*\* is "men", then 519\*\*# will be "man"; in other words, the use of stars (\*) results in upward movement through the cognate sequence and hashes (#)  
20 downwards, except that the first non-numeric key press after a word input must be the star. The use of such an alphanumeric coding technique with the use of cognate forms offers a practicable means of automating alphanumeric paging in a reliable manner and, given the likely expansion in Caller Party Pays paging, this technique has  
25 significant economic importance.

In certain cases, the message (or part thereof) read back by the telephony server 10 will be in a different form to that entered. One example arises when the message includes time or date information. Time information may, for example, be conveniently entered by a four  
30 digit code, corresponding to the time expressed in 24 hour format, followed by a star; when read back, however, the time may be expressed in a.m./p.m. form. Similarly, date information may be entered by a six digit code, corresponding to the date expressed in day/month/year form (in the order preferred by the country in question); when read back,  
35 however, the date may be specified by mentioning the name of the month and the complete year. Other examples include phrase constructions such as occur in French when words such as "que" and "il" together form



"qu'il". A possible form of entry in that case could involve entering the words separately, whereupon the system would recognise the combination from its set of rules and speak back "qu'il".

Although as described above, the system can be used for the  
5 immediate transmission of messages, the addition of a database 15  
allows reminder services to be offered as well. Thus, for example, by  
the use of appropriate codes, the user could enter date/time dependent  
reminders via the telephony server 10 to the database 15, for example  
providing notification of meetings, birthdays, anniversaries and the  
10 like; when the entered date/time matches the current date/time, the  
appropriate reminder will be sent from the database 15 via the  
telephony server 10 and the transmission system 11, or alternatively  
direct from the database 15 to the transmission system 11, to the  
required pager, which can be either the user's own pager or one  
15 belonging to a third party.

The system can also be applied to the provision of contact  
services. Thus, for example, if a message to a pager user, entered as  
described above, gives an indication that the caller wishes to speak to  
the pager user at that instant, a facility can be provided by the  
20 telephony server 10 to hold the call (for example, for a predetermined  
time) whereupon the pager user can telephone the system and be linked  
up with the caller.

It is envisaged that as speech recognition technology improves,  
it may be possible to include this facility to a limited extent in the  
25 system. A speech recogniser 16 would then be associated via audio and  
data links with the telephony server 10. It would accordingly be  
possible to achieve message input by a mix of speech recognition and  
entered codes, the codes being used when the speech recogniser 16 is  
unable to identify a word being spoken.

30 It will be apparent from the above description of the use of the  
letter/word/phrase codes that any person wishing to enter a message  
normally requires access to a list of the code numbers associated with  
each letter/word/phrase. In the event that people do not always have  
access to this information, the system can incorporate a help facility  
35 whereby the telephony server 10 can provide information on particular  
codes. For example, a characteristic code can be used to invoke the  
help mode which would be available at different levels. If, say, the

caller wanted the code of a word beginning with the letter 'C', the caller would enter 03\* (each letter having a numerical value representing its place in the alphabet), whereupon the telephony server 10 would provide a list of codes for words beginning with 'C'. In this mode, it may be possible for the caller to terminate reproduction of the list, once the required code had been given. Alternatively, the system may just provide a spoken list of words which the caller can interrupt either by voice or by MF key input to select the required word. A "nudge" facility can also be provided so that the chosen word can be found by nudging on the stopped position either upwards or downwards.

Equipment users may require the system to have protection against misuse of the system by generation of nuisance or obscene messages. One or more of the following measures may be provided for this purpose.

15 The system may include call logging means such that a record of all entered messages is maintained. This is particularly useful where the incoming calls have calling line identification (CLI) so that the record of messages also identifies the calling telephone number. The system may include an unwanted word list in the telephony server 10 so that any attempt to enter an obscene (or otherwise objectionable) word in letter form would be identified and rejected by the system, this aspect constituting an unwanted word filter. Further, the system may include the ability to enable message entry in letter form only from telephone lines having CLI. Thus non-CLI callers would be able to

20 input word and/or phrase messages, but not compose words in letter form. This latter facility can be enhanced by restricting letter form message entry to CLI callers from telephones other than public payphones, where the telephone network provides the facility for these to be distinguished from other types of telephone. Still further, message entry could be restricted, either totally or at letter input level only, to callers having entered a correct PIN code.

Accordingly, in order to prevent the transmission of malicious or undesirable messages, either all forms of input or letter input may be restricted or monitored. As described above, input may only be allowed

35 when the caller has a correct PIN number, or alternatively letter input may only be allowed if the caller has the correct PIN number, or input may be restricted unless the calling party's CLI is available. In

circumstances where CLI may be provided for all phones including payphones, where available the calling party's category information may be used to restrict access from categories of telephone in order to allow effective monitoring of use and restrictions on the transmission  
5 of unwanted or malicious messages.

As a further enhancement, the system when fitted with an unwanted or obscene word filter could keep a record of attempts to send words that failed the filter checks and where available log calling party information. This is potentially an important aspect of the system, as  
10 the introduction of CLI in the fixed telephone network can significantly reduce the instance of malicious calls, and procedures to ensure the same quality of service in Calling Party Pays paging are therefore potentially important.

As discussed above, the telephone network 14 is a public network  
15 but it will be apparent that communication between the telephones and the telephony server 10 could in appropriate circumstances be provided by a PABX system instead or as well.

If desired, the telephony server 10 can be set up to deliver a personalised acknowledgement or greeting when a caller rings in to  
20 deliver a message for a particular user. This could be either by way of voice synthesis or could be a pre-recorded message. Other types of voice interaction can also be provided by the telephony server 10. For example, if personnel within a company each carry a pager, and the caller does not know an individual's number, it could be possible for  
25 the caller to get the required information by specifying the company name, whereupon a list of numbers and associated personnel would be reproduced. This facility could also be available in a broader context to provide a "directory enquiries" type feature.

Although the invention has been described in the context of a  
30 paging system whereby entered messages are communicated for display on selected pagers, it will be apparent that a similar technique can be used in any system requiring alphanumeric messages to be entered by telephone for onward transmission to a required party. Examples of other such systems include electronic mail systems, teletext systems  
35 and SMS (short message service) telephone systems which provide displays on mobile telephones for the communication of alphanumeric information.

The following Table shows a list of possible codes for use in English language countries. The codes could of course be modified and/or supplemented as desired. Likewise, similar lists of codes could be compiled for different languages.

**TABLE****ALPHABET**

A.....	01*
B.....	02*
C.....	03*
D.....	04*
E.....	05*
F.....	06*
G.....	07*
H.....	08*
I.....	09*
J.....	10*
K.....	11*
L.....	12*
M.....	13*
N.....	14*
O.....	15*
P.....	16*
Q.....	17*
R.....	18*
S.....	19*
T.....	20*
U.....	21*
V.....	22*
W.....	23*
X.....	24*
Y.....	25*
Z.....	26*
space .....	27*
, .....	28*
. .....	29*
: .....	30*
- .....	31*
! .....	32*
? .....	33*
\$ .....	34*

**ACTIVITIES**

badminton .....	51*
cricket .....	52*
cycling .....	53*
dancing.....	54*
football.....	55*
game.....	56*
gardening.....	57*
golf .....	58*
riding.....	59*
rugby .....	60*
running.....	61*

sailing .....	62*
shopping .....	63*
skating .....	64*
skiing .....	65*
sport .....	66*
squash.....	67*
tennis.....	68*
walking .....	69*

**ADJECTIVES**

attractive.....	70*
bad.....	71*
best.....	72*
better .....	73*
boring .....	74*
busy .....	75*
clean .....	76*
clear.....	77*
clever.....	78*
close .....	79*
cold.....	80*
cuddly.....	81*
dark .....	82*
difficult .....	83*
dirty.....	84*
dry .....	85*
earlier .....	86*
early.....	87*
easy.....	88*
elegant.....	89*
empty.....	90*
even.....	91*
fair .....	92*
false .....	93*
far .....	94*
fast.....	95*
first .....	96*
fit .....	97*
free .....	98*
full .....	99*
funny .....	100*
good.....	101*
gorgeous .....	102*
great .....	103*
happy.....	104*
hard .....	105*
healthy.....	106*
heavy .....	107*
high.....	108*

hot .....	109*
impossible.....	110*
kind.....	111*
last .....	112*
late.....	113*
later .....	114*
lazy .....	115*
light.....	116*
little .....	117*
lonely .....	118*
long.....	119*
loud.....	120*
lucky .....	121*
main.....	122*
mature.....	123*
medium.....	124*
middle.....	125*
mobile.....	126*
near.....	127*
new .....	128*
next.....	129*
nice .....	130*
noisy .....	131*
odd.....	132*
old.....	133*
open.....	134*
opposite .....	135*
other .....	136*
outgoing.....	137*
petite.....	138*
poor .....	139*
popular .....	140*
possible.....	141*
quick.....	142*
quiet.....	143*
ready.....	144*
rich .....	145*
right .....	146*
sad .....	147*
safe.....	148*
serious.....	149*
short.....	150*
shut.....	151*
shy .....	152*
silent .....	153*
simple .....	154*
slim .....	155*
slow .....	156*
social.....	157*
soft.....	158*

special .....	159*
sporty .....	160*
steady.....	161*
strong .....	162*
super .....	163*
sweet.....	164*
tall.....	165*
true .....	166*
unhappy .....	167*
upset .....	168*
urgent.....	169*
usual.....	170*
vivacious .....	171*
warm.....	172*
weak.....	173*
well .....	174*
wonderful.....	175*
worse .....	176*
worst.....	177*
wrong.....	178*
young .....	179*

**BODY & CLOTHES**

arm.....	180*
back .....	181*
blouse.....	182*
body .....	183*
bottom.....	184*
bra.....	185*
breast .....	186*
chest.....	187*
clothes.....	188*
coat .....	189*
dress.....	190*
ear.....	191*
eye .....	192*
face .....	193*
finger.....	194*
foot.....	195*
flu.....	196*
glasses .....	197*
hair.....	198*
hand .....	199*
hat.....	200*
head .....	201*
heart.....	202*
ill.....	203*
knee .....	204*
knickers.....	205*

**TABLE (continued)**

leg.....206\*  
 lips.....207\*  
 neck.....208\*  
 nose.....209\*  
 mouth.....210\*  
 pants.....211\*  
 shirt.....212\*  
 shoes.....213\*  
 shoulder.....214\*  
 sick.....215\*  
 skirt.....216\*  
 stomach.....217\*  
 toe.....218\*  
 trousers.....219\*  
 waist.....220\*

**COLOURS**

auburn.....221\*  
 black.....222\*  
 blonde.....223\*  
 blue.....224\*  
 brown.....225\*  
 colour.....226\*  
 gold.....227\*  
 green.....228\*  
 grey.....229\*  
 hazel.....230\*  
 red.....231\*  
 silver.....232\*  
 white.....233\*

**DAY**

monday.....234\*  
 tuesday.....235\*  
 wednesday.....236\*  
 thursday.....237\*  
 friday.....238\*  
 saturday.....239\*  
 sunday.....240\*

**FOOD & DRINK**

american.....241\*  
 beer.....242\*  
 bottle.....243\*  
 bread.....244\*  
 breakfast.....245\*  
 burger.....246\*

butter.....247\*  
 cake.....248\*  
 cheese.....249\*  
 chinese.....250\*  
 chips.....251\*  
 chocolate.....252\*  
 cocktail.....253\*  
 coffee.....254\*  
 cream.....255\*  
 dessert.....256\*  
 diet.....257\*  
 dinner.....258\*  
 dressing.....259\*  
 egg.....260\*  
 fish.....261\*  
 food.....262\*  
 french.....263\*  
 fruit.....264\*  
 ice-cream.....265\*  
 indian.....266\*  
 italian.....267\*  
 lunch.....268\*  
 meal.....269\*  
 milk.....270\*  
 pizza.....271\*  
 salad.....272\*  
 sandwich.....273\*  
 sauce.....274\*  
 seafood.....275\*  
 snack.....276\*  
 soup.....277\*  
 steak.....278\*  
 sugar.....279\*  
 supper.....280\*  
 sweet.....281\*  
 takeaway.....282\*  
 tea.....283\*  
 water.....284\*  
 wine.....285\*

**QUESTIONS**

how.....286\*  
 what.....287\*  
 when.....288\*  
 where.....289\*  
 which.....290\*  
 who.....291\*  
 why.....292\*

**MISCELLANEOUS**

a.....293\*  
 about.....294\*  
 above.....295\*  
 abroad.....296\*  
 access.....297\*  
 accident.....298\*  
 ache.....299\*  
 across.....300\*  
 address.....301\*  
 after.....302\*  
 afternoon.....303\*  
 again.....304\*  
 against.....305\*  
 age.....306\*  
 airport.....307\*  
 all.....308\*  
 always.....309\*  
 an.....310\*  
 another.....311\*  
 answer.....312\*  
 any.....313\*  
 anyone.....314\*  
 anything.....315\*  
 apart.....316\*  
 around.....317\*  
 arrival.....318\*  
 as.....319\*  
 at.....320\*  
 autumn.....321\*  
 away.....322\*  
 a.m.....323\*  
 back.....324\*  
 bag.....325\*  
 ball.....326\*  
 bank.....327\*  
 bar.....328\*  
 because.....329\*  
 bed.....330\*  
 bedroom.....331\*  
 before.....332\*  
 below.....333\*  
 beside.....334\*  
 bike.....335\*  
 bill.....336\*  
 bird.....337\*  
 birthday.....338\*  
 book.....339\*  
 bottom.....340\*

box.....341\*  
 boy.....342\*  
 break.....343\*  
 bridge.....344\*  
 bright.....345\*  
 brother.....346\*  
 burn.....347\*  
 bus.....348\*  
 but.....349\*  
 buy.....350\*  
 by.....351\*  
 bye.....352\*  
 cab.....353\*  
 cafe.....354\*  
 cake.....355\*  
 call.....356\*  
 can.....357\*  
 car.....358\*  
 card.....359\*  
 case.....360\*  
 cassette.....361\*  
 cat.....362\*  
 catch.....363\*  
 CD.....364\*  
 chance.....365\*  
 channel.....366\*  
 chat.....367\*  
 check.....368\*  
 cheer.....369\*  
 cheque.....370\*  
 child.....371\*  
 choice.....372\*  
 christmas.....373\*  
 church.....374\*  
 cigarette.....375\*  
 cinema.....376\*  
 clearly.....377\*  
 close.....378\*  
 cloud.....379\*  
 cloudy.....380\*  
 club.....381\*  
 comedy.....382\*  
 college.....383\*  
 concert.....384\*  
 cook.....385\*  
 corner.....386\*  
 country.....387\*  
 cover.....388\*  
 crash.....389\*  
 credit.....390\*

TABLE (continued)

cross..... 391*	for..... 441*	junction..... 491*	music..... 541*
cry..... 392*	fore..... 442*	just..... 492*	name..... 542*
dad..... 393*	friend..... 443*	kid..... 493*	need..... 543*
dance..... 394*	from..... 444*	kill..... 494*	neither..... 544*
darling..... 395*	front..... 445*	kilometer..... 495*	never..... 545*
date..... 396*	fun..... 446*	kiss..... 496*	news..... 546*
day..... 397*	game..... 447*	kitchen..... 497*	newspaper..... 547*
dear..... 398*	garage..... 448*	lane..... 498*	night..... 548*
debit..... 399*	garden..... 449*	laugh..... 499*	no..... 549*
dentist..... 400*	gas..... 450*	leave..... 500*	nobody..... 550*
departure..... 401*	gatwick..... 451*	left..... 501*	none..... 551*
details..... 402*	gift..... 452*	leisure..... 502*	noon..... 552*
dining..... 403*	gig..... 453*	letter..... 503*	no-one..... 553*
disco..... 404*	girl..... 454*	life..... 504*	nor..... 554*
distance..... 405*	glass..... 455*	light..... 505*	north..... 555*
doctor..... 406*	go..... 456*	like..... 506*	not..... 556*
dog..... 407*	goodbye..... 457*	line..... 507*	now..... 557*
door..... 408*	goods..... 458*	list..... 508*	number..... 558*
down..... 409*	graduate..... 459*	listen..... 509*	of..... 559*
drama..... 410*	group..... 460*	lock..... 510*	off..... 560*
dream..... 411*	guy..... 461*	london..... 511*	offer..... 561*
drink..... 412*	gym..... 462*	lounge..... 512*	office..... 562*
drive..... 413*	half..... 463*	love..... 513*	OK..... 563*
drizzle..... 414*	heathrow..... 464*	luck..... 514*	on..... 564*
dull..... 415*	height..... 465*	machine..... 515*	one..... 565*
east..... 416*	hello..... 466*	magazine..... 516*	only..... 566*
either..... 417*	help..... 467*	magic..... 517*	opera..... 567*
end..... 418*	here..... 468*	make..... 518*	opinion..... 568*
eve..... 419*	hi..... 469*	man..... 519*	or..... 569*
evening..... 420*	hit..... 470*	many..... 520*	other..... 570*
event..... 421*	hold..... 471*	match..... 521*	out..... 571*
ever..... 422*	hole..... 472*	meeting..... 522*	outdoor..... 572*
everyone..... 423*	holiday..... 473*	menu..... 523*	over..... 573*
ext..... 424*	home..... 474*	message..... 524*	overcast..... 574*
fact..... 425*	hope..... 475*	meter..... 525*	owner..... 575*
factory..... 426*	hospital..... 476*	midday..... 526*	pager..... 576*
family..... 427*	hotel..... 477*	midnight..... 527*	pain..... 577*
fax..... 428*	house..... 478*	mile..... 528*	paper..... 578*
feel..... 429*	humour..... 479*	minute..... 529*	parent..... 579*
few..... 430*	husband..... 480*	miss..... 530*	paris..... 580*
file..... 431*	ice..... 481*	model..... 531*	part..... 581*
film..... 432*	idea..... 482*	moment..... 532*	partner..... 582*
find..... 433*	idiot..... 483*	money..... 533*	party..... 583*
finish..... 434*	if..... 484*	month..... 534*	pen..... 584*
flat..... 435*	in..... 485*	moon..... 535*	people..... 585*
floor..... 436*	indoor..... 486*	morning..... 536*	perhaps..... 586*
flower..... 437*	interval..... 487*	motorway..... 537*	period..... 587*
fly..... 438*	into..... 488*	move..... 538*	person..... 588*
fog..... 439*	item..... 489*	much..... 539*	pet..... 589*
foggy..... 440*	job..... 490*	mum..... 540*	phone..... 590*

**TABLE (continued)**

pick.....591*	show .....641*	this..... 691*	work..... 741*
picture.....592*	shower.....642*	ticket..... 692*	world..... 742*
pint.....593*	sister .....643*	tie..... 693*	yard..... 743*
place.....594*	site..... 644*	time..... 694*	year..... 744*
play.....595*	sky ..... 645*	to ..... 695*	yes..... 745*
please .....596*	slowly .....646*	today..... 696*	yesterday..... 746*
position.....597*	smile .....647*	together..... 697*	
pound .....598*	snow .....648*	too ..... 698*	<b>MONTHS</b>
present.....599*	so ..... 649*	tomorrow ..... 699*	january ..... 747*
price ..... 600*	soap ..... 650*	tonight ..... 700*	february..... 748*
problem ..... 601*	softly.....651*	touch..... 701*	march..... 749*
programme ..... 602*	some ..... 652*	town..... 702*	april..... 750*
promise..... 603*	someone ..... 653*	traffic ..... 703*	may ..... 751*
pub ..... 604*	something ..... 654*	train ..... 704*	june ..... 752*
pull ..... 605*	somewhere.....655*	travel..... 705*	july ..... 753*
push..... 606*	soon ..... 656*	trip ..... 706*	august..... 754*
p.m. .... 607*	sorry ..... 657*	try ..... 707*	september..... 755*
question ..... 608*	sort ..... 658*	tube..... 708*	october..... 756*
queue..... 609*	south..... 659*	tunnel..... 709*	november ..... 757*
quickly..... 610*	speed ..... 660*	turn ..... 710*	december ..... 758*
quite ..... 611*	star..... 661*	TV ..... 711*	
race ..... 612*	start ..... 662*	type..... 712*	<b>NUMBERS</b>
radio ..... 613*	station..... 663*	under ..... 713*	0..... 0*
rain ..... 614*	stay ..... 664*	until ..... 714*	1..... 1*
rainy ..... 615*	stew ..... 665*	up..... 715*	2..... 2*
range ..... 616*	stop..... 666*	update..... 716*	3..... 3*
read ..... 617*	storm ..... 667*	very ..... 717*	4..... 4*
relative ..... 618*	story..... 668*	video ..... 718*	5..... 5*
report ..... 619*	street..... 669*	village ..... 719*	6..... 6*
rest ..... 620*	student..... 670*	visit ..... 720*	7..... 7*
restaurant ..... 621*	summary ..... 671*	vote..... 721*	8..... 8*
ride ..... 622*	summer..... 672*	wait..... 722*	9..... 9*
right..... 623*	sun ..... 673*	walk ..... 723*	
ring ..... 624*	sunny ..... 674*	wash..... 724*	<b>PERSONAL</b>
road ..... 625*	swim ..... 675*	watch ..... 725*	I..... 759*
room..... 626*	table..... 676*	way ..... 726*	you ..... 760*
rose..... 627*	take..... 677*	weather..... 727*	he ..... 761*
round..... 628*	talk..... 678*	wedding ..... 728*	she..... 762*
roundabout..... 629*	tape..... 679*	week ..... 729*	it..... 763*
run..... 630*	taxi..... 680*	weekend..... 730*	we ..... 764*
rush ..... 631*	team..... 681*	weight..... 731*	they ..... 765*
save ..... 632*	television ..... 682*	west ..... 732*	my ..... 766*
school..... 633*	thank..... 683*	whenever ..... 733*	your..... 767*
season..... 634*	that ..... 684*	wherever..... 734*	his ..... 768*
selection ..... 635*	the ..... 685*	wife ..... 735*	her..... 769*
sense..... 636*	theatre ..... 686*	will..... 736*	its ..... 770*
series ..... 637*	then ..... 687*	winter ..... 737*	our ..... 771*
service ..... 638*	there ..... 688*	with..... 738*	
sex ..... 639*	thing ..... 689*	without ..... 739*	
shop..... 640*	think ..... 690*	woman ..... 740*	



**TABLE (continued)**

me .....772\*  
 him .....773\*  
 us .....774\*  
 them .....775\*  
 mine .....776\*  
 their .....777\*  
 hers .....778\*  
 don't .....779\*  
 I'd .....780\*  
 I'm .....781\*  
 I'll .....782\*  
 I've .....783\*  
 it's .....784\*  
 he's .....785\*  
 let's .....786\*  
 she's .....787\*  
 that's .....788\*

**STAR SIGNS**

capricorn .....789\*  
 aquarius .....790\*  
 pisces .....791\*  
 aries .....792\*  
 taurus .....793\*  
 gemini .....794\*  
 cancer .....795\*  
 leo .....796\*  
 virgo .....797\*  
 libra .....798\*  
 sagittarius .....799\*  
 scorpio .....800\*

**VERBS**

access .....801\*  
 ache .....802\*  
 am .....803\*  
 arrive .....804\*  
 be .....805\*  
 bike .....806\*  
 bill .....807\*  
 book .....808\*  
 break .....809\*  
 burn .....810\*  
 buy .....811\*  
 call .....812\*  
 can .....813\*  
 cancel .....814\*  
 carry .....815\*

catch .....816\*  
 chat .....817\*  
 clean .....818\*  
 clear .....819\*  
 close .....820\*  
 come .....821\*  
 cook .....822\*  
 could .....823\*  
 cover .....824\*  
 credit .....825\*  
 cry .....826\*  
 dance .....827\*  
 date .....828\*  
 debit .....829\*  
 depart .....830\*  
 diet .....831\*  
 disconnect .....832\*  
 discover .....833\*  
 do .....834\*  
 dream .....835\*  
 dress .....836\*  
 drink .....837\*  
 drive .....838\*  
 eat .....839\*  
 engage .....840\*  
 enter .....841\*  
 excite .....842\*  
 expect .....843\*  
 fall .....844\*  
 fax .....845\*  
 feel .....846\*  
 find .....847\*  
 finish .....848\*  
 fit .....849\*  
 fly .....850\*  
 forget .....851\*  
 get .....852\*  
 give .....853\*  
 go .....854\*  
 had .....855\*  
 have .....856\*  
 hear .....857\*  
 hold .....858\*  
 hope .....859\*  
 invite .....860\*  
 is .....861\*  
 kiss .....862\*  
 know .....863\*  
 last .....864\*  
 laugh .....865\*

leave .....866\*  
 let .....867\*  
 light .....868\*  
 like .....869\*  
 listen .....870\*  
 lock .....871\*  
 lose .....872\*  
 love .....873\*  
 lunch .....874\*  
 make .....875\*  
 marry .....876\*  
 match .....877\*  
 mean .....878\*  
 meet .....879\*  
 might .....880\*  
 miss .....881\*  
 move .....882\*  
 must .....883\*  
 need .....884\*  
 offer .....885\*  
 open .....886\*  
 page .....887\*  
 park .....888\*  
 party .....889\*  
 pay .....890\*  
 permit .....891\*  
 phone .....892\*  
 pick .....893\*  
 play .....894\*  
 postpone .....895\*  
 practice .....896\*  
 promise .....897\*  
 pull .....898\*  
 push .....899\*  
 race .....900\*  
 rain .....901\*  
 read .....902\*  
 relax .....903\*  
 remember .....904\*  
 report .....905\*  
 require .....906\*  
 ride .....907\*  
 ring .....908\*  
 run .....909\*  
 rush .....910\*  
 save .....911\*  
 say .....912\*  
 sell .....913\*  
 send .....914\*  
 service .....915\*

shall .....916\*  
 shop .....917\*  
 show .....918\*  
 shut .....919\*  
 sing .....920\*  
 skate .....921\*  
 ski .....922\*  
 sleep .....923\*  
 slip .....924\*  
 smile .....925\*  
 smoke .....926\*  
 snow .....927\*  
 sort .....928\*  
 speed .....929\*  
 spend .....930\*  
 start .....931\*  
 stay .....932\*  
 stop .....933\*  
 study .....934\*  
 swim .....935\*  
 take .....936\*  
 talk .....937\*  
 tape .....938\*  
 tell .....939\*  
 thank .....940\*  
 think .....941\*  
 tie .....942\*  
 touch .....943\*  
 travel .....944\*  
 try .....945\*  
 turn .....946\*  
 type .....947\*  
 use .....948\*  
 video .....949\*  
 visit .....950\*  
 vote .....951\*  
 wait .....952\*  
 walk .....953\*  
 want .....954\*  
 was .....955\*  
 wash .....956\*  
 watch .....957\*  
 went .....958\*  
 will .....959\*  
 win .....960\*  
 work .....961\*  
 would .....962\*

**TABLE (continued)****DATE****dd:mm:yy ... ddmmyy\***

- a six digit code will send the date in  
 day:month:year format

**TIME****hh:mm ...hhmm\***

- a four digit code in the range 0000 to  
 2359 will send the time in hour:minute  
 format (24 hour clock).

**NAME****"first name" ... nnnn\***

- a four digit code in the range 3000 to  
 8999 will send an associated first name  
 (refer to name code list).

**NUMBERS****number ... nnn ... n#**

- any digit string followed immediately by #  
 will send the preceding number.

**STANDARD PHRASES**

are you free?.....	974*
are you free tonight?.....	975*
are you free tomorrow? .....	976*
do you want to go out tonight?.....	977*
I'll be late .....	978*
I'll be there at .....	979*
I'll call later .....	980*
I love you.....	981*
I'm at home .....	982*
I'm at school.....	983*
I'm at work.....	984*
I'm leaving now .....	985*
I'm still at work.....	986*
I'm working late.....	987*
please call .....	988*
please call dad .....	989*
please call home .....	990*
please call me .....	991*
please call mum.....	992*
please call my mobile .....	993*
please call the office .....	994*
when are you free? .....	995*
when shall we meet?.....	996*
where are you? .....	997*
where shall we meet?.....	998*

**LONG WORDS**

announcement.....	963*
appointment.....	964*
conversation.....	965*
disconnected .....	966*
electricity .....	967*
entertainment.....	968*
information .....	969*
intelligent .....	970*
interesting .....	971*
professional .....	972*
unattractive .....	973*

**OTHER COMMANDS**

delete space....	010*
delete word ....	050*
ENTER .....	999*
HELP .....	000*

**REPLY COMMANDS**

YES.....	1
NO .....	0

CLAIMS

1. A communication system comprising means for decoding alphanumeric messages entered by the use of telephone dialling means, and means for  
5 transmitting the alphanumeric messages to selected receivers having message displays, wherein the message decoding means comprises a telephony server operable to read back messages entered by the telephone dialling means for confirmation of correct entry.
- 10 2. A system according to claim 1, wherein the alphanumeric messages are entered by using numerical codes corresponding to letters, words and/or phrases.
- 15 3. A system according to claim 2, wherein the numerical codes are substantially as set out in the Table herein.
4. A system according to claim 2 or claim 3, wherein the words associated with particular codes can be modified into cognate form by further code entry.  
20
5. A system according to claim 4, wherein the further code entry involves one or more inputs of the star or hash keys.
- 25 6. A system according to any one of the preceding claims, wherein the telephony server includes means for storing a list of words for reading back to the caller entering the message.
- 30 7. A system according to claim 6, wherein the telephony server is operable to read back a word in word form if included in the stored list irrespective of whether the word has been entered in letter or word form.
8. A system according to claim 6 or claim 7, wherein the telephony server is operable to read back a message upon completion of entry, any  
35 words not included in the stored list being spelt.
9. A system according to any one of the preceding claims, wherein

the telephony server includes means for generating spoken words from pre-stored rules, and is operable to read back each entered word irrespective of whether the word has been entered in letter or word form.

5

10. A system according to claim 9, wherein the telephony server is operable to read back a message upon completion of entry, any words not capable of automatic generation by the word generating means being spelt.

10

11. A system according to any one of claims 6 to 8, wherein the stored list of words includes a list of personal names.

12. A system according to any one of the preceding claims, wherein  
15 the telephony server is operable in accordance with a set of rules to read back messages in a different form to that entered.

13. A system according to claim 12, wherein the telephony server is  
operable to read back time and/or date information in a.m./p.m. form  
20 and/or day/month/year form upon entry in numerical form.

14. A system according to any one of the preceding claims, wherein  
the telephony server includes a help facility for providing spoken  
information as to operation of the system and/or details of particular  
25 codes.

15. A system according to any one of the preceding claims, including  
means for logging of entered messages.

30 16. A system according to any one of the preceding claims, wherein  
the telephony server includes an unwanted word list and means for not  
permitting confirmed entry of any word on the unwanted word list.

17. A system according to any one of the preceding claims, including  
35 means for enabling entry of messages in letter form only from a  
telephone connection providing calling line identification.

18. A system according to claim 17, wherein the enabling means is operable to enable letter form message entry only when the calling line identity connection is not from a public payphone.
- 5 19. A system according to any one of the preceding claims, including means for preventing entry of messages at least in letter form in the absence of entry of an approved PIN code.
20. A system according to any one of claims 1 to 19, wherein the  
10 transmitting means and the receivers form part of a paging system.
21. A system according to any one of claims 1 to 19, wherein the transmitting means and the receivers form part of a mobile telephone system provided with a short message service facility.
- 15 22. A system according to any one of claims 1 to 19, wherein the transmitting means and the receivers form part of an electronic mail system or a teletext system.
- 20 23. A system according to any one of the preceding claims, including a database for storing time and/or date dependent messages and for forwarding each message via the transmitting means at the appropriate time and/or date to a selected receiver.
- 25 24. A system according to any one of the preceding claims, including a speech recogniser associated with the telephony server, allowing messages to be entered partially in spoken form and partially by the telephone dialling means.
- 30 25. A system according to any one of the preceding claims, wherein the telephony server is operable to hold an incoming call following message entry, and to link that call with a response call from the message recipient.
- 35 26. A communication system substantially as herein described with reference to the accompanying drawing.

**Patents Act 1977****Examiner's report to the Comptroller under Section 17  
(The Search report)**Application number  
GB 9507752.5**Relevant Technical Fields**

(i) UK Cl (Ed.N) G4H (HNP)

(ii) Int Cl (Ed.6) H04Q

Search Examiner  
M J DAVISDate of completion of Search  
18 MAY 1995**Databases (see below)**

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii)

Documents considered relevant  
following a search in respect of  
Claims :-  
1-26**Categories of documents**

- X:** Document indicating lack of novelty or of inventive step.      **P:** Document published on or after the declared priority date but before the filing date of the present application.
- Y:** Document indicating lack of inventive step if combined with one or more other documents of the same category.      **E:** Patent document published on or after, but with priority date earlier than, the filing date of the present application.
- A:** Document indicating technological background and/or state of the art.      **&:** Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2124419 A (NEC) whole document eg page 3 lines 92 to 112	1 at least

**Databases:** The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).